ANALOGICAL REASONING IN EARLY CHINESE PHILOSOPHY*

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It was suggested, earlier in this century, that the Chinese mind was incapable of developing a science of logic because it was «too illogical in itself».[1] Enmeshed in the concrete features of this world, Chinese philosophizing never rose to the stage of abstract thinking.[2] This impression seemed to gain some support from the wide-spread use Chinese philosophers made of analogical reasoning. As this type of reasoning is commonly ranked as an inferior, unreliable and unscientific method of thinking, so Chinese philosophizing too was condemned – by a facile syllogism – to be no more than an inferior, unreliable and unscientific attempt at grasping reality. The statement that the Chinese were incapable of developing a theory of logic meant, before the discovery of mathematical logic, that they were incapable of handling syllogisms.[3] This view has been challenged by numerous scholars, especially by Chinese thinkers such as Zhang Binglin[4] and Zhan Jianfeng,[5] who swiftly tracked down the few syllogisms that were lurking in the jungle of early Chinese philosophical literature.[6] It should be noted however that syllogistic reasoning is basically a logical decision procedure. It enables us to transform a certain type of inference into a normal form, or into a canonical pattern.

1 Cf. A. Forke, «The Chinese Sophists», in *Journal of the China Branch of the Royal Asiatic Society* 34 (1901/2), p. 5.
2 Cf. M. Granet, *La pensée chinoise,* Paris, 1934, 1968, pp. 37 and 276; Liou Kia-Hway, «The configuration of Chinese reasoning», in *Diogenese* 49 (1965), pp. 66–96.
3 See M. Granet, *op. cit.,* p. 277.
4 Cf. *Guogu lunheng,* chapter *Yuanming* (criticized by Hu Shih, *The development of the logical method in ancient China,* Shanghai, 1922, pp. 97–8). See also the bibliography of Cheng Chung-Ying, «Inquiries into classical Chinese logic», in *Philosophy East and West* 15 (1965), pp. 204–15.
5 Cf. *Mojia de xingshi luoji,* Hubei, 1979 (first edition 1956), pp. 110–18.
6 P. Masson-Oursel looked for «sorites» (a kind of polysyllogism); see his «La démonstration confucéenne. Note sur la logique chinoise prébouddhique», in *Revue de l'histoire des religions* 67 (1913), pp. 49–54.

Once cast into this normal form (which comprises a major premise, a minor premise and a conclusion), we are able to decide whether this form, this syllogism, is or is not valid, as we have the complete list of valid syllogisms. If syllogistic reasoning is not backed up by the notions of logical form, decision procedure, proof theory, the presence of its form must be seen as a mere coincidence. No conclusion as to the advancement of a science of logic in China may be drawn from the occurrence of a handful of syllogisms. More recent attempts have tried to show that Chinese reasoning comes closer to predicate logic[7] or class logic[8] than to syllogistic reasoning.

It is in general not a safe method to judge the logical achievements of the first Chinese philosophers by comparing them to Western standards of reasoning. These Western standards, as D. C. Lau puts it, «met with little success, but even if they had been more successful, it would still be interesting to find out how the ancient Chinese themselves looked at reasoning.»[9] If we truly want to discover how Chinese logic operates, we will have to study, as Zhao Yuanren has suggested, «how logic operates in Chinese.»[10] The purpose of this study will be to see how logical reasoning operates in analogies.[11]

Not all analogies, of course, are argumentative analogies. There is nothing logical, for example, in the following, well-known analogy: «Man's life on earth is of so short a duration, that you can compare it to a team of four horses passing quickly by a crack in the wall.»[12] This is simply a metaphor to convey the idea of the shortest possible instant of time, just as *qiuhao* «fine autumn hair» expresses the concept of the smallest possible visible unit. I shall call this type of analogy an «illustrative analogy». It will not be considered here.

Analogical reasoning, I suggest, is an original product of Chinese intellectual history. The justification for this claim is twofold. In the first place, it seems that analogical *reasoning* is extremely rare in early Greek

7 See J. S. Cikoski, «On standards of analogical reasoning in the late Chou», in *Journal of Chinese philosophy* 2 (1975), p. 325.

8 See the studies of J. Chmielewski, «Notes on early Chinese logic I-VIII», in *Rocznik Orientalistyczny* 26–32 (1962–69).

9 Cf. D. C. Lau, «Some logical problems in ancient China», in *Proceedings of the Aristotelian Society* 53 (1952/3), p. 189.

10 Chao Yuan-Ren, «How Chinese logic operates», in *Anthropological linguistics* 1 (1959), p. 1.

11 Mathematical logic will be used in this essay only to check the validity of some of the inferences made by Chinese philosophers. To this purpose, mathematical logic certainly is descriptively adequate, although it might not be explanatorily adequate.

12 Mozi, chapter 16, p. 74/9.

philosophical literature.[13] We find there, instead, mostly in connexion with cosmological speculation, another type of analogy, which I shall term «heuristic analogy». Its purpose is different from that of argumentative analogies. Heuristic analogies mainly consist in attempts at explaining the unknown by the known.[14] Here is an example: «Anaximenes says that the stars are fixed in the crystalline in the manner of nails... .»[15] Moreover, the logical problems analogical reasoning had to face in Ancient China are far more complex than has hitherto been assumed. Some of the processes involved have not, until fairly recently, come to the attention of linguists and logicians. Let these two reasons suffice to show that analogical reasoning in China is worth investigating.

In order to make clear my own approach to analogical reasoning, I have to develop first a model of analogical reasoning. This model is devised especially with a view to the logical features involved in early Chinese analogical reasoning. The advantage it has over previous models chiefly consists in its ability to treat under one head notions as different as those of «logical consistency», «category» *(lei)*, «inference rule», «argument by contradiction», «substitution rule», «natural logic».

An argumentative analogy consists of two parts, which I shall label *exposition* and *application*. Whereas the exposition is normally fully expressed, the application is more often than not only hinted at. The immediate constituents of the exposition are its *terms.* By «term», I understand an element of the exposition which has a corresponding explicit or implicit counterpart in the application. The logical relations holding between the terms constituting the exposition determine what I shall call the *logical structure* of the exposition or the *premises* of the exposition. By *logical properties* of the exposition I shall understand the sum of the inferences that follow logically from the premises of the exposition. Let me now give an example.

> Ch'un-yü K'un said, «Is it prescribed by the rites that, in giving and receiving, man and woman should not touch each other?»
> «It is», said Mencius.
> «When one's sister-in-law is drowning, does one stretch out a hand to help her?»
> «Not to help a sister-in-law who is drowning is to be a brute. It is prescribed by the rites that, in giving and receiving, man and woman should not touch each other, but in stretching out a helping hand to the drowning sister-in-law one uses one's discretion.»

13 If not altogether absent; see for example J. Barnes *The presocratic philosophers,* London, 1982, p. 55.
14 Numerous examples of this type of analogy can be found in G. E. R. Lloyd's study *Polarity and analogy,* Cambridge, 1966, pp. 384–420.
15 For the reference and the context, see J. Barnes, *op. cit.,* p. 55.

«Now the Empire is drowning. Why do you not help it?»

«When the Empire is drowning, one helps it with the Way; when a sister-in-law is drowning, one helps her with one's hand. Would you have me help the Empire with my hand?»[16]

The terms of the exposition and their corresponding counterparts in the application are, according to my analysis, the following:

EXPOSITION	TERMS	APPLICATION
the rites	P	the Way
constitutive principle of the rites (man and woman) should not touch each other while giving and receiving)	Q	constitutive principle of the Way (not making a compromise, for example)
the sister-in-law is drowning	R	the Empire is «drowning»
the sister-in-law is rescued	S	the Empire is saved
to be a brute	T	to be a brute
to use one's discretion, i.e. resort to weighing relative benefit and harm	U	resort to weighing

The formalization of this well-known analogy from the *Mencius* will give us the logical relations holding between the terms. Its logical structure, as I reconstruct it, consists of the following four premises:

LOGICAL STRUCTURE

1. $P \supset Q$
2. $(R \,\&\, \neg S) \supset T$
3. $S \equiv \neg Q$
4. $(\neg Q \,\&\, S) \supset U$

1. If the rites prevail, man and woman do not touch while giving and receiving.
2. If your sister-in-law is drowning and you do not rescue her, then you are a brute.
3. Your sister-in-law is rescued if and only if you seize her hand.
4. If you seize the hand of your sister-in-law to rescue her, then you resort to weighing (of relative benefit and harm).

The logical properties of the analogy are determined by the inferences that can be drawn from these four premises. It is easy to see, for example, that the proposition «if the rites are observed, then the sister-in-law is not rescued

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16 MENCIUS IV, A, 17. I have used the translation of D. C. Lau, MENCIUS, Penguin Books, 1983 (first edition 1970), pp. 124–5.

while drowning» logically follows from premises 1. and 3. Chunyu Kun, the opponent of Mencius, claims that the logical properties of the exposition are transposable *salva veritate* onto the application of this analogy. The whole analogy can indeed be rewritten by simply replacing the terms of the exposition by those of the application (see table). Chunyu Kun's main thesis is that «if the Empire is drowning and you do not resort to weighing, then you are a brute» (formalized: [R & ˥ U] ⊃ T). This proposition follows logically (truth-functionally) from the four premises established before.[17] Our first result then is that Chunyu Kun's argumentative analogy is formally valid. We are going to see later why Mencius nevertheless does not accept it.

Once the formal element in argumentative analogies is recognized, we can enquire into the kind of logical relations that may be expressed in analogies. I will not hesitate to say that virtually every logical structure is expressible by means of an argumentative analogy, although, in practice, there may be limits. Turning now to the logical structures that happen to be expressed in the analogies devised by the early Chinese philosophers, it appears at once that certain structures were more in favour than others. Chinese thinkers are especially fond of analogies by contradiction,[18] i.e., analogies whose logical structure contains a contradiction. Here are two examples from the *Mozi.*

> Gongmengzi said: «Poverty or wealth, old age or premature death, all are determined by Heaven and cannot be changed.» But he also said: «The gentleman must study.» Mozi commented: «To be in favour of fatalism and yet maintain that men should study, this is like telling somebody to cover his hair while removing his hat.»[19]

> Gongmengzi said: «There are neither ghosts nor spirits.» But he also maintained: «The gentleman must study the sacrificial rites.» Mozi commented: «Study the sacrificial rites while affirming that there are no spirits, this is like studying the ceremonials of hospitality where there are no guests; this is like knotting nets while there are no fish.»[20]

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17 The direct proof of this conclusion would be fairly long. Indirect proof is simpler in this case. Take the conjunction of premises 1. to 4. as the antecedent and the conclusion (R & ˥ U) ⊃ T as the consequent of an implication. Suppose then, *per absurdum,* that this implication is false. It is false if and only if U and T have negative truth-values and R has a positive truth-value. But if you admit this same distribution of truth-values for the antecedent, it becomes inconsistent, which is contrary to the hypothesis. Hence it is impossible for (R & ˥ U) ⊃ T not to follow from premises 1. to 4.

18 This type of analogy has been studied by D. Leslie, *Argument by contradiction in pre-buddhist Chinese reasoning,* Canberra, 1964.

19 Mozi, chapter 48, p. 275/1.

20 Mozi, chapter 48, p. 276/8.

The logical structure of this last analogy is a very simple one:

EXPOSITION	TERMS	APPLICATION
knot nets	P	study sacrificial rites
there are fish	Q	there are spirits

The logical structure of the analogy can be represented by means of the following two premises:

1. $P \equiv Q$ 1. You knot nets if and only if there are fish
2. $P \mathbin{\&} \neg Q$ 2. Gongmengzi knots nets while there are no fish

The logical structure of this analogy is a strange one, for it expresses a contradiction: the inference $Q \mathbin{\&} \neg Q$ logically follows from the two premises. Mozi wants to draw attention to Gongmengzi's illogical behaviour; hence the contradiction in both analogies. It is clear that premises 1. and 2. cannot both be true. Mozi strongly supports premise 1. He derives it, I would guess, from the utility criterion laid down in the *feiming* chapter-triad. If so, then premise 2. has to be corrected. This can be done in two ways: either by negating P (i.e., stop studying sacrificial rites) or by affirming Q (i.e., accept the existence of spirits). Gongmengzi then either has to abandon the study of sacrificial rites, or he has to start believing in the existence of spirits, if he wants to be consistent with himself. He cannot have it both ways.

Analogies by contradiction do not simply assert the bare fact of contradiction. They eventually show the way out of it. Take the following analogy from chapter 2 of the *Zhuangzi:*

> For there to be «that's it, that's not» before they are formed in the heart would be to go to Yue today and have arrived yesterday.[21]

A first, unexpressed, premise says: «you can arrive at Yue if and only if you have previously set out to get there». This corresponds to Zhuangzi's premise (also unexpressed): «there can be judging of alternatives if and only if one has previously made up one's mind», meaning that each judgment is relative to the person who utters it and that it does not refer to objective features in the outer world. The logical principle here expressed is the one of a *necessary condition,* a condition *sine qua non.* The mind, a subjective princi-

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21 ZHUANGZI, chapter 2, p. 9/2; for the translation see A.C. Graham, *Chuang-tzu. The seven inner chapters and other writings from the book Chuang-tzu,* London, 1981, p. 51.

ple, is the condition of there being alternatives. For Zhuangzi, different viewpoints do not refer to different objects having an independent existence in the outer world. True debating, therefore, is impossible. Here, as elsewhere, Zhuangzi of course uses logic to deride logic.

This same principle, i.e., the one of a necessary condition, happens also to be expressed by means of another, wide-spread analogy:

Who can hold something hot and not cool his hand first with water?[22]

The notion of causality is of paramount importance in logical reasoning. The Mohists were aware of this at an early date. The difference there is between a necessary condition and a sufficient condition is brought out very nicely by them by means of two complementary analogies. Here is the first one.

> Master Mozi was ill. Die Bi entered his room and asked: «Master, you said that ghosts and spirits are omniscient, that they have the power to send blessing and misfortune, and that they reward the good and punish the evil. However, you are a sage. How can it be that you are ill? Is it that these teachings of yours are incorrect, or is it that the ghosts and spirits lack omniscience?» Master Mozi replied: «Even if I am ill, how could the spirits' lack of omniscience be held responsible for it? Diseases can be contracted in many ways. Some diseases are caused by excessive cold or heat; others are caused by excessive work or hardship. If there are one hundred gates and you shut only one of them, how can you prevent the burglar from getting in?»[23]

Sickness is the kind of event that may have more than one cause. Mozi enumerates several causes: climate, exhaustion, evil conduct and so on, until you reach the symbolic figure of one hundred. By adopting virtuous conduct, only one of one hundred possible causes, namely punishment by omniscient spirits for evil conduct, is disclosed. You shut only one gate.

Consider now the following analogy from chapter 8 of the *Mozi*:

> Superiors employ inferiors by appealing to only one criterion (namely «select the worthy, employ the able»). Inferiors serve their superiors by means of only one skill (namely «be able, be worthy»). Compare this to the rich man who builds a high wall around his splendid palace and who, after the completion of the wall, pierces only one gate. If there is a burglar getting in, the rich man shuts the gate through which the burglar has come in, and then searches for him. The burglar cannot get out by another way (that means, he has to come back to the gate). And then, the rich man can get hold of him. Why? – Because the rich man occupies the strategic point.[24]

22 Cf. MENCIUS IV, A, 7; MOZI, chapter 9, p. 30/-5.
23 MOZI, chapter 48, p. 280/10.
24 MOZI, chapter 8, p. 26/-5.

Mozi intends to show that the principle of employing the worthy is a necessary condition of good government. For him, there is only one «gate» to it, and this gate is called «employ the worthy». This last analogy, the «one-gate-analogy» symbolizes an event which can have only one cause; the foregoing analogy, the «one-hundred-gates-analogy», shows how it is possible for an event to have more than one cause.[25] Note the interesting pictorial representation of the logical mechanism.

It can be said that a truly argumentative analogy always embodies a rule of inference.[26] This principle can be brought out very clearly by analyzing another analogy from the *Mencius*.

(Mencius says to King Xuan of Qi)
«Should someone say to you, 'I am strong enough to lift a hundred chün but not a feather; I have eyes that can see the tip of a fine hair but not a cartload of firewood,' would you accept the truth of such a statement?»
«No.»
«Why should it be different in your own case? Your bounty is sufficient to reach the animals, yet the benefits of your government fail to reach the people. That a feather is not lifted is because one fails to make the effort; that a cartload of firewood is not seen is because one fails to use one's eyes. Similarly, that peace is not brought to the people is because you fail to practice kindness.»[27]

This analogy provides us with two expositions:

EXPOSITION	TERMS	APPLICATIONS
strong enough to lift a heavy load/ eyes that can see the tip of a fine hair	P	compassion is sufficient to reach the animals
not strong enough to lift a feather/ unable to see a cartload of firewood	Q	compassion is not sufficient to reach the hundred surnames
not to use one's strength/ not to use one's power to see	R	not to use one's compassion

25 But see also the more abstract formulation of these two principles in the Mohist Canon *(Mojing)*, theorem A 1; cf. A. C. Graham, *Later Mohist logic, ethics and science*, London, Hong Kong, 1978, pp. 263–5.
26 I owe this insight to a percipient article of W. Sacksteder, «The logic of analogy», in *Philosophy and rhetoric* 7 (1974), p. 236.
27 MENCIUS I, A, 7; translation by D. C. Lau, *op. cit.*, p. 56.

The logical structure of the analogy is the following:
1. (P & Q) ⊃ R
2. P
Its logical property is: ¬ R ⊃ ¬ Q

What Mencius tries to press out of King Xuan of Qi is that if he resorts to compassion *(en),* the benefits will reach the hundred surnames (i.e., ¬ R ⊃ ¬ Q). All that is needed, then, to prove the validity of this analogy is to show that the proposition ¬ R ⊃ ¬ Q logically follows from the premise (P & Q) ⊃ R. It does so on condition that we supply a second premise, namely: 2. P in the application. This condition is easily fulfilled, as the text of the *Mencius* gives us the missing premise: the king had once shown compassion for an animal.[28]

Two remarks are now in order. First, argumentative analogies are a purely formal device. Background information is useful only in so far as it contributes to an adequate understanding of the logical properties of the analogy.[29] Secondly, an analogy cannot prove the truth of an argument. It can only show its formal validity. Any inference, to be correct, has to fulfill two conditions: its premises must be true, and the argument must be formally valid. Argumentative analogies only prove formal validity (or invalidity), but this they do in a perfectly cogent manner.

Argumentative analogies are also a fairly wide-spread phenomenon in philosophical texts other than the *Mencius* or the *Mozi.* In the *Lüshichunqiu* for example (see chapters 18.6, 18.7, 21.5), the sophist Hui Shi always resorts to argumentative analogies when making his point against Bai Gui, Kuang Zhang, or King Hui of Wei.[30] Each one of these debates invariably adopts the form of an analogy followed by a counter-analogy. The White-Horse-

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28 Proof:
      1. (P & Q) ⊃ R   (premise)
      2. P   (premise
         ¬ R ⊃ ¬ Q   (conclusion)
      (i)   ¬ R ⊃ ¬ (P & Q)   1., contrap.
      (ii)   ¬ R ⊃ (¬ P v ¬ Q)   (i), De Morgan
      (iii)   ¬ R ⊃ (P ⊃ ¬ Q)   (ii), def. ⊃
      (iv)   P ⊃ (¬ R ⊃ ¬ Q)   (iii), permut. of antec.
      (v)   ¬ R ⊃ ¬ Q   (iv), 2., mod. ponens

29 Here we diverge from D. C. Lau's analysis; see his «On Mencius' use of the method of analogy in argument», in *Asia Maior* 10 (1963), p. 173.

30 For a translation, an interpretation and a critical edition of these texts, see my *Les fondements philosophiques de la rhétorique chez les sophistes grecs et chez les sophistes chinois,* Berne, 1985, pp. 301-31.

Treatise *(Baimalun)* of Gongsun Long seems, at first sight, to represent a notable exception to my claims. But the whole treatise, as I have shown elsewhere,[31] can be read as one single, although very intricate, argumentative analogy.

Analogical reasoning, in the instances examined so far, comes very close to formal logic. It appears to operate in very much the same way as does formal logic, namely with variables. Indeed the terms of the analogy could very well be conceived of as empty predicate places. There is however one important difference between analogical reasoning and formal logic: formal logic appeals to variables on which no, ar almost no, substitutional constraints are laid, whereas the empty places, the terms, in argumentative analogies cannot be filled with any type of predicate. This difference can be brought out very neatly by reverting to one of our preceding analogies *(Mencius* I, A, 7). Let us first see how the dialogue ends in the *Mencius.*

> (Mencius to King Xuan of Qi)
> «Hence your failure to become a true King is due to a refusal to act, not to an inability to act.»
> «What is the difference in form between refusal to act and inability to act?»
> «If you say to someone, 'I am unable to do it', when the task is one of striding over the North Sea with Mount T'ai under your arm, then this is a genuine case of inability to act. But if you say, 'I am unable to do it', when it is one of massaging an elder's joints for him, then this is a case of refusal to act, not of inability. Hence your failure to become a true King is not the same in kind *(lei)* as 'striding over the North Sea with Mount T'ai under your arm', but the same as 'massaging an elder's joints for him.'»[32]

King Xuan's question allows us to infer that he did not rank «compassion» *(en)* with predicates such as «strength» *(li)* or «clear-sightedness» *(ming).* He probably thought of compassion as a charismatic endowment rather than as a dispositional state. Mencius on the other hand is eager to prove that compassion *is* of the same kind *(lei)* as strength and clear-sightedness. He therefore attempts to prove that «compassion» expresses, like «strength» and «clear-sightedness», a dispositional state, i.e., a quality one can have without presently displaying it. King Xuan certainly agrees with Mencius on the logical form of the analogy. The point then on which he is not willing to give in is the category, the kind *(lei),* of the key-term «compassion».

31 *Op. cit.,* pp. 411–13.
32 Mencius I, A, 7; translation by D. C. Lau, *op. cit.,* p. 56.

The same remark applies to the analogy Chunyu Kun had tried to enforce upon Mencius (*Mencius* IV, A, 17; see above). This analogy, as we have already seen, is logically sound. Mencius' disagreement arises from the substitutions Chunyu Kun intends to make in the basic model. For Chunyu Kun, the term «Way» and the term «rites» belong to one and the same category. Mencius, by his final response, «Would you have me help the Empire with my hand?» points to the fundamental difference that exists between «the Way» and «the rites». If you violate a constitutive principle of the rites, you do so in order to obey the imperatives of a still higher principle, namely humanity, which requires a drowning person to be rescued. The Way however has not got above it any higher principle. Hence the very possibility of «weighing» *(quan)* is ruled out in this case. To sum up: in order to be correct, all analogical reasoning has to fulfill two conditions. First, it has to comply with the formal standards of logical reasoning; second, the terms of the application must be in some sense similar to those of the exposition.

One would expect to find both of these aspects represented in the logical discussions of the first Chinese philosophers. The formal aspects of analogical reasoning however have received surprisingly little attention in comparison with the remarkable logical performances recorded in the *Mencius* and in the *Mozi*. The only explanation of this rather strange phenomenon seems to me to admit that the first Chinese philosophers possess a spontaneous and intuitive capacity of reasoning, which proceeds as yet unhampered by the fetters of speculative grammar and metaphysics. But if one can say that the formal aspects of analogical reasoning does not put the early Chinese philosophers before any serious problems, the same is not true for the second condition, i.e., the problem of the similarity of the terms. Basically speaking, then, the problem of the validity of argumentative analogies amounts to finding out which structure-preserving substitutions can be made in the exposition of an analogy in order to yield in the application a formally valid piece of reasoning. This means that we have now to search for a criterion likely to guide these structure-preserving substitutions. Such a criterion is easily formulated: the corresponding terms in the exposition and in the application must be of the same kind *(lei)*.

The concept of lei is indeed central to all analogical reasoning. If we look for a technical vocabulary for stating the rules of the «art of debating» *(bian)*, we regularly fall back upon statements describing or regulating the use of analogies. These discussions are almost always concerned with the category, the *lei,* of the terms of an analogy. Refusal of a given analogy is often expressed by saying that the terms of its exposition are «of a different kind» *(yilei[1])* than the terms of the intended application. The expression «ig-

noring the category» *(bu zhi lei)* is very frequent in these contexts.[33] The isolated example of an «overlooked category» *(yilei²)* is also worth noting.[34]

The notion of *lei* is extremely difficult to handle. The non-technical meanings of the word are certainly «to imitate» or «to be similar». It's etymology however is obscure, and so is the character representing it. Hence the halo of vagueness that surrounds *lei* in its logical contexts. Every object may, after all, be considered similar to any other object. This is the position Zhuangzi adopts in chapter 2 of the *Zhuangzi,* and again at the beginning of chapter 5. Depicting the attitude of the sage (here represented by the mysterious teacher Wang Tai), Zhuangzi writes in chapter 5:

> «Death and life are mighty indeed, but he refuses to alter with them; though heaven were to collapse and earth subside he would not be lost with them. He is aware of the flawless and is not displaced with other things; he does his own naming of the transformations of things and holds fast to their Ancestor. (...) If you look at them from the viewpoint of their differences, from liver to gall is as far from Ch'u to Yüeh; if you look at them from the viewpoint of their sameness, the myriad things are all one.»[35]

The best way of characterizing Zhuangzi's position is to say that he identifies the activity of *categorizing* with the activity of *naming*. But naming, as we can learn from chapter 2 of the *Zhuangzi,* is for him an entirely subjective, and hence an arbitrary, activity:

> «This is likewise That, That is likewise This. There they use 'is-this' and 'is-not' from one point of view, here we use 'is-this' and 'is-not' from another point of view. Are there really a That and a This? Or really no That and This? Where neither That nor This finds its opposite is called the axis of the Tao.»[36]

Zhuangzi, like most of the early Chinese philosophers, reflected deeply upon the notion of *lei* and its role in the art of debating. When he shows in chapter 2 that disputation is impossible, he starts precisely by undermining the concept of *lei*.[37] For Zhuangzi, disputation had come to a dead end. He thought to have administered the coup de grâce to dialectics by proving that

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33 See for example Mozi, chapter 50, p. 294/1; Mencius VI, A, 12 and VI, A, 11 (with *Hanshi waizhuan* 4,27); *Lüshi chunqiu* 13.4, p. 130/9 (likely to be of Mohist origin).

34 Zhuangzi, chapter 24, p. 159/5; there is also the expression *linlei* «neighbouring category», see *Lüshi chunqiu* 10.3, p. 100/7.

35 Zhuangzi, chapter 5, p. 31/-8; translation by A.C. Graham, *op. cit.,* pp. 76-77.

36 Zhuangzi, chapter 2, p. 10/2; translation by A.C. Graham in his *Later Mohist logic, ethics and science,* p. 441.

37 Zhuangzi, chapter 2, p. 12/-4.

no suitable criterion for fixing the kind could be found. Zhuangzi's criticism certainly holds as long as the classification of things, events and processes into their corresponding kinds has to rest upon the intuitive knowledge of the native speaker. One could of course imagine Chinese logicians setting up empirical lists of things and processes belonging to one and the same kind, hoping to provide thereby a reliable guide to structure-preserving substitution. There are lists of this kind: chapter 17 of the *Huainanzi* and chapter 25.2 (title: *bielei* «distinguishing between kinds») of the *Lüshichunqiu* are good examples. But these lists rather draw attention to and warn against illicit inferences from one *lei* to another.

The logical problems raised by the concept of *lei* cannot be solved by a classification of the things, or the facts themselves, into corresponding categories. Argumentative analogies, as we have seen, are supposed to hold between sets of statements, not between statements and facts. The only way to solve the problem of determining the category was to indicate a *formal* criterion. If anybody in ancient China came near to the solution of this tantalizing problem, he must have thought along the same lines as the Later Mohist logicians. One of the Later Mohists' central concerns is to point out that Zhuangzi fundamentally misunderstood the logic of the activity of naming. The Later Mohists had noticed, as A. C. Graham rightly observes, that «the whole art of disputation is discredited if, as Chuang-tzu maintains, the distinctions marked by «that» and «this» are unreal. The Mohist answer is that the relativity of the demonstratives has no bearing on the reality of the distinctions.»[38] The Later Mohists do not say that naming is not categorizing; they only point out that naming, and hence categorizing, is not an entirely subjective matter, but obeys to certain rules. The Later Mohists believe that consistent description is intimately connected with the activity of naming correctly, i.e., of naming the similar similarly and the different differently.[39] Seen in this way, the Later Mohists' conception of *lei* comes close to the development of a general method of finding categories of names. At the beginning of their treatise on «Names and objects» (as reconstructed by A. C. Graham), they point out the categorial difference that exists between «white» and «big»:

> «If this stone is white, when you break up this stone all of it is the same as the white thing; but although this stone is big, it is not the same as the big thing. In all cases of naming

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38 *Later Mohist logic, ethics and science*, p. 441; cf. theorem B 68, *ibid.*, pp. 440–41.
39 Theorem B 1; see *Later Mohist logic, ethics and science*, pp. 348–49.

otherwise than by reference to number or measure, when you break up the object, all of it is the thing in question.»[40]

Every part of a white stone is white, but not every part of a big stone is also big. This is to say that «big» and «white» belong to different categories of names. Whereas this first fragment introduces a difference between naming by reference or number and naming by shape or characteristics, the next fragment extends the list to include naming on the basis of residence and migration.[41] But the list is far from being closed.[42]

The Mohists' purpose is to show that there are different criteria of naming, and that these criteria may not be applied at random. Moreover, the criterion initially chosen must be followed until the end of the entire argument.

The relevance of categories of names for analogical reasoning becomes immediately apparent if we consider cases such as the following: Somebody objects to the Mohist doctrine of universal love *(jian ai)* that it is impossible to love each single man, since the number of men is potentially infinite. The Later Mohists reply by explaining to their opponent the logical functioning of the predicate «to love». «To love» *(ai),* they say, operates in the same way as «to ask» *(wen).* It is possible *to ask* about an infinite number of men; hence it is also possible *to love* an infinite number of men.[43] The Later Mohists' method can also have negative applications. Consider the following case.

«A white horse is a horse. To ride a white horse is to ride horses. A black horse is a horse. To ride a black horse is to ride horses. Jack is a person. To love Jack is to love people ('persons'). Jill is a person. To love Jill is to love people.»[44]

At first sight it seems as if the grammatically similar expressions «to love people» and «to ride horses» were also of the same logical type. But the Later Mohists point out that the logical and the syntactical parallelism holding between «to ride horses» and «to love people» breaks down as soon as the reference shifts from «some horses» to «all horses» and from «some man» to «all men». They write:

40 «Names and objects», fragment 1 (= NO 1); *Later Mohist logic, ethics and science,* pp. 470–71.
41 Cf. NO 2; *Later Mohist logic, ethics and science,* pp. 470–71.
42 The problem of the nature of Chinese categories is further developed in my «Greek and Chinese categories. A re-examination of the problem of linguistic relativism», forthcoming in *Philosophy East and West.*
43 Cf. theorem B 74; *Later Mohist logic, ethics and science,* pp. 449–50.
44 NO 14; *Later Mohist logic, ethics and science,* p. 485.

«He loves people» requires him to love all people without exception, only then is he deemed to love people. «He does not love people» does not require that he loves no people at all; he does not love all without exception, and by this criterion is deemed not to love people. «He rides horses» does not require him to ride all horses without exception before being deemed to ride horses; he rides some horses, and by this criterion is deemed to ride horses. On the other hand «He does not ride horses» does require that he rides no horses at all; only then is he deemed not to ride horses.[45]

But if quantification is likely to bring to the surface the fundamental logical differences that exist between syntactically similar terms, the more so are negation and epistemic or intensional contexts, not to speak of a combined influence of both. The authors of «Names and objects» were well aware of these difficulties. Here is an example that brings into play all of these factors:

«Robbers are people, but abounding in robbers is not abounding in people, being without robbers is not being without people.
How shall we make this clear? Disliking the abundance of robbers is not disliking the abundance of people, desiring to be without robbers is not desiring to be without people. The whole world agrees that these are right; but if such is the case, there is no longer any difficulty in allowing that,
although robbers are people,
loving robbers is not loving people,
not loving robbers is not not loving people,
killing robbers is not killing people.
The latter claims are the same in kind *(tong lei)* as the former; the world does not think itself wrong to hold the former, yet thinks the Mohists wrong to hold the latter. (...)»[46]

It certainly would be wrong to interpret the Later Mohists' method of parallel predicates as an attempt at establishing the outlines of a system of formal logic. The truth is that these first Chinese logicians immediately go for the much more difficult question as to how logic operates in a natural language. They start, so to say, at a point where contemporary logicians have got to only quite recently. But the Later Mohists have to strive with bare hands, whereas our contemporaries have at their disposal a whole arsenal of systems of formal logic. The consequence of the – fundamentally correct – approach of the Later Mohists is that they miss the discovery of logic and grammar as two independent disciplines. The Later Mohists only draw lists of cases where they note a divergence between logic and grammar. What in-

45   NO 17; *op. cit.,* p. 491.
46   NO 15; *op. cit.,* pp. 487–88.

terests them is the divergence, not logic or grammar as such. I shall use an analogy myself to make this idea clear. Take the case of a native speaker of the French language who starts to learn English. After having noticed that both languages have many elements and structures in common, our student decides to learn only the differences he finds between English and French. The method of this student, although pedagogically not recommendable, is nevertheless successful up to a certain point. For this student, English is no more than a list of differences; it is not a new language, properly speaking. It is the sum of the modifications he has to add to his native language in order to be able to communicate in new, Anglo-Saxon, surroundings.

The first Chinese philosophers learn logic in much the same way as our French student learns English. They possess, right at the outset, a perfect, although unconscious, mastery over the grammatical system of their language. This system embodies, up to a certain degree, logical reasoning, just as some rules of French grammar also hold for English. But the Chinese do not focus on logical reasoning as such: they are interested only in the differences between logic and grammar, i.e., in those cases where their native tongue is bound to lead them into a logical error, just as our French student is interested only in the differences there are between French and English. The result, in both cases, is the same: English, just as logic, is not looked upon as an independent discipline.

My analogy also suggests an explanation of this situation. Since the attitude of our French student, who merely notes the differences, is sensible only in so far as the number of common points between French and English is greatly superior to their differences, we are driven to the rather surprising conclusion that the Chinese language is a logically well organized system which requires only minimal corrections when put into new, logico-philosophical, surroundings.

EDITIONS

I have used the new *Zhuzi jicheng* edition (Hong Kong, 1978, 8 vol.) of the texts of the classical Chinese philosophers. The references are to chapter and/or page and column. The *Zhuangzi* is quoted according to Wang Xianjian's *Zhuangzi jijie*. The writings of the Later Mohists (chapters 40–45 of the *Mozi*) are quoted according to A. C. Graham's edition in *Later Mohist logic, ethics and science,* London, Hong Kong, 1978. I have also used A. C. Graham's translations.

LOGICAL SYMBOLS

⌐	negation
⌐ P	not P
⊃	implication
&	conjunction
≡	equivalence
v	disjunction

GLOSSARY

ai	愛
baimalun	白馬論
bian	辯
bielei	別類
bu zhi lei	不知類
en	恩
feiming	非命
jian ai	兼愛
lei	類
li	力
linlei	鄰類
ming	明
quan	權
qiuhao	秋豪
tonglei	同類
wen	問
yilei[1]	異類
yilei[2]	遺類